A STUDY ON PHYSICO-CHEMICAL PROPERTIES, ANTIOXIDANT EFFICACY, STORAGE AND SENSORY EVALUATION OF FRESH AND DRIED KARONDA(CARISSA CARANDAS)

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SYNOPSIS

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INTRODUCATION

Karonda (Carrisa carandas Linn.) is an important minor edible underexploited fruit crop of India (Bhavya et al 2017). It belongs to family Apocynaceae and is commonly known as Karonda in India, Bengal currant or Christ's thorn in South India (Imran et al 2012). It is found wild in Bihar, West Bengal, South India and as commercial plantations in Varanasi district of Uttar Pradesh. Carrisa species is of much socio-economic importance in the tribal areas of Gujarat, Rajasthan and Madhya Pradesh. The stem is rich in white latex and the branches contain sharp spines. Flowers are small, measuring 3-5 cm in diameter, with white colors. Flowering starts in the month of January- February and fruits mature in May-June. Fruits are generally harvested at immature stage for vegetable purpose, fully ripen fruits are consumed (Youngken HW 1950).

A great beauty of plant is that its leaves are shining and ornamental and it bears flowers and fruits almost throughout the year (Banik et al 2012).The sweeter types may be eaten raw but the more acid ones are best stewed with plenty of sugar(Yadav et al 2018)). The alcoholic extract of the roots of C. carandas had been reported to possess cardiotonic activity and antihypertensive activity . The ripe fruit is cooling and acidic; used to treat sore throat, mouth ulcer and skin disorders . The fruits possess significant amount of jelly grade pectin. (Dey et al 2017) . The fruits are useful as an auxiliary in tanning and dyeing and for medicinal purposes. The leaves of karonda can be used as fodder for tusser silk worm. The unripe fruit is sour, astringent, bitter, thermogenic, constipating, anaphrodisiac, antipyretic, and useful in vitiated conditions of pitta and kapha, hyperdipsia, diarrhoea, anorexia and intermittent fevers. The ripe fruit is sweet, cooling, appetiser and antiscorbutic and is useful in burning sensation, skin diseases, scabies, . The roots are anthelmintic, stomachic and antiscorbutic and are useful in stomach disorders, intestinal worms, scabies (Dey et al 2017). Decoction of its leaves is also used against fever, diarrhoea and ear ache, and the roots are used for stomachic, remedy for itches, and insect repellent(Yadav et al 2018; Singh and Uppal 2015)

However there are many studies on medicinal importance of stem and leaves of kaonda ,but not much scientific nutritional based on composition, phytochemicals etc are available. Hence the present study focuses on edible portion of the fruit, nutrient composition, antioxidant efficacy ,storage studies, value addition and sensory evaluation of fresh and dried karonda fruit for acceptability levels. The karonda fruit is highly seasonal fruit which is available in the season of January to April .So the present study would like to make an efforts to make it available throughout the year through the scientific storage studies of karonda fruit. Hence a research study on the study of physico- chemical properties, nutrient composition ,antioxidant efficacy ,storage and sensory evaluation of fresh and dried Karonda (*Carissa carandas*) is proposed to research with the following objectives.

Objectives

1. To study the Physical properties of fresh and dried karonda fruit(*Carissa carandas*).
2. To study the Nutrient composition of fresh and dried Karonda fruit(*Carissa carandas*).
3. To study the selected Antioxidant efficacy of fresh and dried Karonda fruit(*Carissa carandas*).
4. To develop the value added products using fresh and dried karonda fruit(*Carissa carandas*).
5.To evaluate the products prepared out of fresh and dried karonda fruit (*Carissa carandas*)

Review of literature

Title	Authoer		Year
Studies On The Propagation Of Karonda (Carissa Carandas L.)	DEEPIKA	Results of experiment on rooting of cuttings revealed that among different treatments IBA 8000 ppm recorded highest rooting percentage and lowest rooting was recorded in control. As the successful rooting of cuttings is determined both by number of roots formed and by root elongation and growth. Therefore it is concluded that IBA 8000 ppm was best in rooting performance of karonda cuttings followed by IBA 9000 ppm and 4% sucrose compared to control.	2013-14
Storage Of Seeds And Germination Studies In Karonda (Carissa Carandas L.)	K.T., MUTHANNA	It is concluded from the present investigation that seeds stored in aluminium foil coated pouch in refrigerator after two months of storage and treated with GA3 at 100ppm was found to be best for seed storage, germination and growth of seedlings.	2015
Effect Of Blending Of Karonda (Carissa Carandas L.) Juice With	SK. Shaheel	Among the different blended juices the combination of karonda	2015

Guava, Papaya And Pineapple Juices On Its Qualityand Organoleptic Evaluation		juice with pineapple juice showed best in physico-chemical properties and organoleptic evaluation	
Studies On Effect Of Different Pre - Sowing Treatments On Germination Of Karonda (Carissa Carandas L.) Seeds	Bhavya N	Germination of karonda seeds and morphological characters of karonda seedlings can be enhanced when seeds were soaked in water upto 8 hours.	2017
Shelf Life Of Karonda Jams (Carissa Carandas L.) Under Ambient Temperature	R. A. Wani*	the present findings it is concluded that Karonda, which is the minor fruit of India can be utilized for making jam and this jam can be stored for at least three months without undergoing any deterioration and evidently Treatment 4 (1.0 kg Karonda pulp + 1150 g sugar) showed the best results with regard to physical, chemical and sensory parameters of jam.	2013
Studies On Seed Storability, Germination And Seedling Vigour Of Karonda (Carissa Carandas L.)	DEEPIKA	The karonda seeds could be stored for 10 days after extraction from fruits at ambient condition with good seed vaibility and vigour. studies shows	2016
Shelf Life Of Karonda Jams (Carissa Carandas L.) Under Ambient Temperature	R. A. Wani	Based on the experimental study it was concluded that among all the treatments, treatment 4 was the best with regard to physical, chemical and sensory parameters of jam.	2013
Traditional Uses, Pharmacological Action And Phytochemical Analysis Of Carissa	Tamrat Tesfaye	He overall evaluation of this review shows that alcohol (methanol and ethanol) extraction followed by aqueous is	2018

Carandas Linn.:A Review		the appropriate solvent for the extraction of C. carandas in order to get more phytochemical constituents. Further research has to be carried out to fractionate, purify and characterize the extracts, in order to find out the bioactive molecule which is responsible for human ailments by using dLؤerent extraction techniques.	

Methodology:

I. Physical Analysis

1. Total weight of the fresh and dried fruit
2. Plup weight of the fresh and dried fruit
3. Length of the fresh and dried fruit
4. Width of the fresh and dried fruit
5. Number of seeds present in the fresh fruit.
6.seed weight in the fresh and dried fruit.

II. Chemical Analysis

A. Proximate principles

1. Estimation of moisture using Anon Method (Anon, 2000).
2. Estimation of Ash using Anon Method (Anon, 2000).
3. Estimation of crude fiber using Acid alkali hydrolysis method (Ranganna 1986)
4. Estimation of Total Lipids using AOAC method
5. Estimation of protein using estimated by Kjeldhal plus method using Pelican Kel plus equipment (Anon., 2000).
6. Estimation of carbohydrates using (Ranganna 1986)

B. Minerals

1. Estimation Iron by wet digestion using triacid mixture (Anon., 2000).
2. Estimation of calcium titrimetric method (Ranganna, 1986).

3. Estimation of Phosphorus by calorimetric method. (Ranganna, 1986).

III. Antioxidants Analysis

1. Estimation of total phenolic was determined by the spectophotor method (Singleton V.L., Rossi J.J.A., 1965)
2. Estimation of tannins using Method of AOAC (2005)

3. Estimation of Flavonoids using the method given by Chang.C.,Yang.M., Wen H. and Chern, J.2002

4. Estimation of Vitamin C in fresh and dry sample using the AOAC method(2005)

6. Estimation of Total antioxidant capacity using spectrophotometric method as mentioned by Shirwaikar*et al*., (2003).

IV. Processing of the fruit sample by

Sun drying

Freezing,

Microwave drying

V. Sensory evaluation of Raw & Cooked samples

The different products will be prepared using fresh and dried fruit and sensory evaluation of these Raw & Cooked samples will be carried out using 9 point Hedonic scale with scores 9- like extremely & 1- dislike extremely

Same of the products are pickle, sambar, chtnuy, jam,jelly

VI. Storage studies of the fruit

Storage studies will be carried out by using different storage methods like freezing, drying etc method. It involves packaging ,shelf life study. Microbial estimation The samples are taken out periodically for quality analysis.

VII. Statistical analysis

The results of investigation will be analyzed using completely randomized designs, one way and two way analysis of variances ,To know the significant difference between the treatments critical differences test will be employed using SPSS latest version.

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